

tion is 1 part per million (Dreisback, 1963). In the presence of water, phosgene is converted into hydrochloric acid and carbon dioxide and it is the corrosive action of the acid which is responsible for the changes which occur in the body. Consequently phosgene may have little effect on the relatively dry areas of the upper air passages, but will cause considerable damage to the alveoli of the lungs, where there is a high concentration of water vapour. With prolonged inhalation the released hydrochloric acid will also attack the walls of the trachea and bronchi (Prentiss, 1937).

In the horse, death usually occurs within 24 hours of exposure, but it is not often seen before the 7th hour. Death is the result of asphyxia and on *post-mortem* examination the lungs appear voluminous, oedematous and congested with raised grey areas of emphysema alternating with dark red areas of collapse. Fluid escapes from the cut surface and frothy fluid is present in the bronchi and trachea, which also fills the nasal cavity. Small haemorrhages are seen on the stomach and heart, but there is little or no inflammatory change in the laryngeal, tracheal and bronchial mucosae. The right heart is dilated (Anon. 1945). The essential condition is therefore one of pulmonary oedema of an inflammatory origin (Cappell, 1958).

Richters (1939) pointed out that hens are extremely sensitive to phosgene poisoning and the lesions observed are similar to those in mammals, with the greatest changes occurring in the terminal alveoli and bronchioles. Claussen (1931) also remarked on the widespread oedema present in the lungs of affected birds.

The *post-mortem* examination of the 2 hens and budgerigar showed lesions similar to those described by the above authors, and there appears to be little doubt that these birds had died from phosgene gas poisoning. Such incidents have apparently been rare in this country, but in view of the increasing use of various organo-chlorine compounds, the possibility of accidental phosgene gas poisoning must be borne in mind.

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Removal of a Prolapsed Eyeball in a Wild Black Rhinoceros

BY

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Introduction

THE subject was a female black rhinoceros approximately 30 years old living in the Masai Amboseli Game Reserve near the foot of Mount Kilimanjaro in Kenya. A report was received that she had injured an eye.

Preliminary Examination

Distant examination through binoculars showed that the eyeball was protruding. The eye was covered with mud which made detailed examination impossible, but from excoriations on the banks of the mud wallow in which she was lying it was evident that she had been rubbing it and it was supposed that considerable trauma had taken place. It was decided that the rhinoceros should be immobilised and the eye more closely examined and if possible surgical interference should be attempted in order to reduce pain and the risk of serious infection.

Immobilising Drug

The immobilising drug used was 1-(1-phenylcyclohexyl) piperidine HCl.* This was prepared by first dissolving 1.0 g. of the drug in 4 c.c. sterile water. 1.5 c.c. of the solution was then put into each of two 5 c.c. syringes and 1,500 I.U. hyaluronidase in 1 c.c. water was then added to each syringe and the syringes filled up with sterile water. The drug was administered by means of a special syringe† fired from a crossbow. An automatic device injects the contents shortly after impact. The first dart was unsuccessful, but the second, fired at 9.15 a.m., was effective and although the rhinoceros was lost in thick bush for a time, she was eventually found lying on her side about an hour later. Her legs were tied together and a free supply of oxygen was admitted into her nostrils by means of a polythene tube.

Pre-operative Examination

The eye and surrounding area was cleaned with warm water and soap. The whole eyeball was protruding and was badly damaged. The cornea had ruptured and the sclera and surrounding tissues were bruised and badly contaminated with mud and grit. There were 2 puncture wounds behind the eye, the significance of which is unknown.

It was decided to remove the eyeball and surrounding infected tissues.

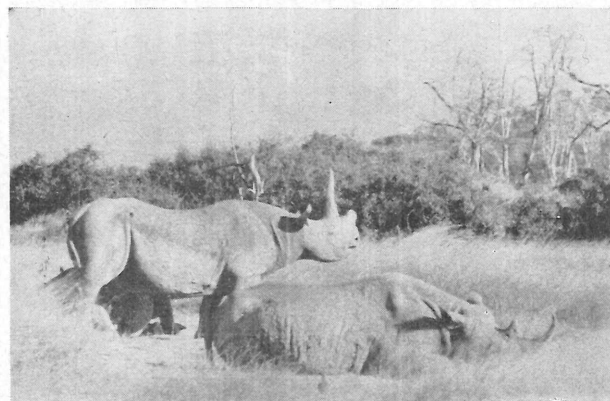
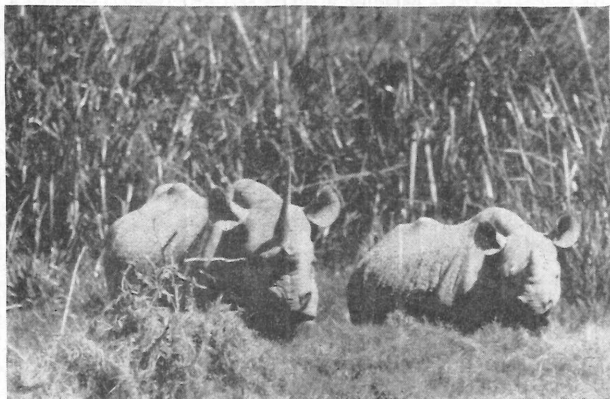
Surgical Procedure

Phencyclidine is more correctly considered as a

*Sernyl (Parke Davis) or "Phencyclidine."

†Palmer Chemical Equipment Ltd., with East African Modifications.

sedative rather than an anaesthetic, and its use to facilitate trans location is fairly well known. It had been noticed during the pre-operative cleansing and examination that the rhinoceros had occasional bouts of struggling, although these appeared to be unconnected with painful stimuli. In view of this and because little is known about the reaction of rhinoceroses to this drug when used in larger doses as an anaesthetic, it was considered that the use of a local anaesthetic would obviate the necessity of further administration of phencyclidine in this aged animal.



Rhinoceros in the Game Reserve.

At 10.30 a.m. 30 c.c. of local anaesthetic, procaine hydrochloride 2 per cent. with adrenaline*, were injected, using a 3 inch \times 1/6 inch hypodermic needle, into the tissues around the eye and particularly surrounding the optic nerve.

Incisions were then made along the lids behind the eyelashes, and the eye, eyelids, conjunctiva, tear glands and surrounding tissues were dissected out and removed in the same way as is usually performed for complete enucleation of the eyeball of cattle. It was noticed that while incisions and dissection of the eyeball caused no response the severing of the optic nerve appeared to stimulate a short bout of struggling. There was comparatively little bleeding. Blood vessels were twisted off with artery forceps and the wound was packed with sulphanilamide powder and closed with interrupted sutures of nonabsorbable material.† A small opening was left at the inner canthus to allow for drainage.

The other minor wounds were dressed with sulphanilamide powder. G.2.5 of oxytetracycline hydrochloride‡ was injected intramuscularly.

Recovery

The ropes were removed and the patient was splashed with water. She made several attempts to rise and eventually regained her feet at 12.30 p.m., and was left under guard to prevent attacks from predators. At 4.30 p.m. she was again examined and was moving somewhat unsteadily but eating. The following morning she had moved back to her old area and was eating, and accompanied by her calf.

Result

About 2 weeks after the operation the wound opened partially, probably due to the attack of tick-birds, but granulation had taken place and the wound was completely closed a week later. At no time was there any excessive discharge from the wound. Although the remains of a suture was observed 3 weeks after the operation it did not appear to cause irritation and subsequently disappeared. At the time of writing, 2 years after the operation the wound has completely healed. There is a very slight depression at the operation site, but this is not at all unsightly. The rhinoceros is living a normal life and appears in good condition. The interference has in no way altered her previous good nature and she is frequently observed at fairly close quarters, in the company of several other rhinoceroses, by the numerous visitors to the Masai Amboseli Game Reserve.

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*Planocaine, May & Baker.

†Vetafil.

‡Terramycin, Pfizer.